# Chapter 8. Five Kingdom Classification

## Exercise 1

### Solution A.

1. (d) vertebrates and invertebrates
2. (d) Bat, Parrot, Oyster – Vertebrates
3. (c) Rana tigrina
4. (d) Mule is neither a donkey nor a horse.

### Solution B.1.

Carolus Linnaeus had introduced the binomial system of naming living beings.

### Solution B.2.

The two characters common to dog, humans, squirrel, bat, camel and monkey are:
(c ) external ears
(d) give birth to young ones

### Solution B.3.

| Column I | Column II |
|---|---|
| 1.Pine | (iv) Gymnosperm<br>(v) Plantae |
| 2. Earthworm | (vi) Animalia |
| 3. Bread mould | (i) Fungi |
| 4. *Amoeba* | (vii) Protista |
| 5. Moss | (v) Plantae<br>(viii) Bryophyta |
| 6.Bacteria | (ii) Monera<br>(iii) Prokaryote |

### Solution C.1.

Phylum → Class → Order → Family → Genus → Species

### Solution C.2.

| Man | Domestic cat | Peepal tree |
|---|---|---|
| | | |

| *Homo sapiens* | *Felis domesticus* | *Ficus religiosa* |
|---|---|---|

**Solution C.3.**

In science, people from different countries with different languages have to read about each others research. So, it was necessary to eliminate any possible confusion created by local names. Scientific names are based on certain rules which are universal. They are unique and can be used to identify an organism anywhere around the world. That is why, scientific names of living beings are considered better than their common names.

**Solution C.4.**

According to the 'Two-Kingdom Classification', proposed by Carolus Linnaeus in 1758, living organisms were classified into two broad kingdoms, Plants and Animals.
The drawbacks in classifying organisms under the old two kingdom classification are:

1. Bacteria were kept in Kingdom Plantae. These organisms have no chlorophyll and do not carry out photosynthesis. Bacteria do not have a definite nucleus nor a nuclear membrane nor chromosomes.
2. Fungi were kept in Kingdom Plantae. Bread mould is a multicellular fungi. However, it does not possess roots, stem and leaves, lacks chlorophyll and does bear any flowers, fruits and seeds like plants.

**Solution C.5.**

Species means an organism of a particular kind whose members can interbreed among themselves to produce fertile young ones.
All humans on the earth today may differ widely in their facial features, colour, height, etc. Yet, they belong to a single species Homo sapiens because they can interbreed among themselves and produce a normal offpsring.

**Solution C.6.**

Ficus religiosa (Peepal)
Zea mays (Maize)
Bombyx mori (Silkmoth)

**Solution C.7.**

The five kingdoms according to the new classification are:

1. Kingdom Monera
2. Kingdom Protista
3. Kingdom Fungi
4. Kingdom Plantae
5. Kingdom Animalia

**Solution C.8.**

(a) Animals with a backbone: Vertebrata
(b) Animals with a hairy skin: Mammalia

(c ) Animals with three pairs of legs: Insecta
(d) Animals with feathers: Aves

**Solution C.9.**

**Invertebrate animals:**

1. Housefly
2. Silverfish
3. Jellyfish
4. Sponge

**Solution C.10.**

(a) Protozoa and Metazoa

| Protozoa | Metazoa |
|---|---|
| Unicellular organisms | Multi-cellular organisms |

(b) Vertebrate and Invertebrate

| Vertebrates | Invertebrates |
|---|---|
| Have their unique backbone with the spinal cord | Do not have a backbone |

(c) Insecta and Arachnida

| Insecta | Arachnida |
|---|---|
| Have three pairs of legs | Have four pairs of legs |

(d) Flatworm and Roundworm

| Flatworm | Roundworm |
|---|---|
| Dorso-ventrally flattened | Cylindrical in shape and are tapered at both ends |

**Solution C.11.**

(i) Amoeba – Nucleus, tentacle, food vacuole
(ii) Hydra – Invertebrata, Cnidaria, Crustacea
(iii) Fish – Gills, paired fins, ear drum
(iv) Earthworm – Invertebrata, Annelida, Insecta
(v) Grasshopper – Wings, trachea, proboscis
(vi) Butterfly – Insecta, Invertebrata, Mollusca
(vii) Whale – Gills, mammary glands, fat under the skin
(viii) Pigeon – Feathers, wings, hair

(ix) Monkey – External ear, sweat glands, lateral line
(x) Bat – Aves, Mammalia, Chordata

**Solution C.12.**

| Cold-blooded animals | Warm-blooded animals |
|---|---|
| These animals cannot maintain their body temperature. Their body temperature is regulated by the external environment. | Animals whose body temperature is kept relatively constant by internal mechanisms. |
| E.g. Insects, Amphibians | E.g. Birds, Mammals |

**Solution C.13.**

1. Class Amphibia: Tree frog
2. Class Reptilia: Cobra
3. Class Aves: Duck

**Solution D.1.**

(a) Insects and Birds

| Similarity | Difference | |
|---|---|---|
| Have wings | Insects | Birds |
| | Invertebrates | Vertebrates |

(b) Whales and Fishes

| Similarity | Difference | |
|---|---|---|
| Aquatic | Whales | Fishes |
| | Have lungs for breathing | Have gills for breathing |

(c) Snakes and Earthworms

| Similarity | Difference | |
|---|---|---|
| Do not have any limbs | Snakes | Earthworm |
| | Vertebrates | Invertebrates |

(d) Bat and Pigeon

| Similarity | Difference | |
|---|---|---|
| Breathe through lungs | Bat | Pigeon |
| | Have external | Have internal |

| | | |
|---|---|---|
| | ears | ears |

(e) Cuttlefish and Dogfish

| Similarity | Difference | |
|---|---|---|
| Marine animals | Cuttlefish | Dogfish |
| | Invertebrates | Vertebrates |

(f) Wall lizard and Frog

| Similarity | Difference | |
|---|---|---|
| Cold-blooded animals | Wall lizard | Frog |
| | Completely adapted to life on land | Live partly on land and partly in water |

**Solution D.2.**

| Column I | Column II |
|---|---|
| Annelida | Earthworm |
| Porifera | Sponge |
| Mollusca | Octopus |
| Reptilia | Snake |
| Pisces | Trout |
| Mammal | Rabbit |

Amphibia from Column I and Pigeon from column II are left out. They do not match as Pigeon comes under Class Aves and not Class Amphibia.

**Solution E.**

No, it is not a relative of Kangaroo as Kangaroo is a mammal and Tyrannosaurus is a reptile.

**Characteristics of Tyrannosaurus:**

1. Body has scales which may be horny
2. Lays eggs which have a leathery shell
3. One of the dinosaurs which moved on the earth. These ruled the earth. Some were vegetarian, others were non-vegetarian. Archaeopteryx is a link between reptiles and birds. Its fossils have been found, which vanished from the earth due to ice-age.
4. Had three-chambered heart as ventricles are partially divided
5. Cold-blooded animals